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First Named Inventor: CLEARY, JAMES D.
Application No.: 10/678841 Confirmation No.: 1146
Filed: October 3, 2003
Title: METHOD AND APPARATUS FOR BONDING ORTHODONTIC APPLIANCES
TO TEETH

REPLY BRIEF

Commissioner for Patents
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CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR § 1.8(a)]

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May 9, 2007 /Amber Nicholson/
Date Signed by: Amber Nicholson

Dear Sir:

This Reply Brief is presented in response to the Examiner's Answer mailed March 9, 2007. Its entry and consideration by the Board are respectfully requested.

Fees

- ☐ Any required fee will be made at the time of submission via EFS-Web. In the event fees are not or cannot be paid at the time of EFS-Web submission, please charge any fees under 37 CFR § 1.17 which may be required to Deposit Account No. 13-3723.
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Rejections Under 35 U.S.C. 103(a)

Claims 43-52 were rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen et al. (US 3,949,477) in view of Hare (US 5,316,473). Review and reversal of this rejection by the Board are respectfully requested.

The cited references simply do not teach or suggest a method of bonding orthodontic appliances to teeth by placing an array of solid state light emitters in the oral cavity along a path that is located in an occlusal direction from the outer tips of the patient's teeth. Nor do the references teach an orthodontic bonding method wherein those light emitters are activated in order to direct light in a gingival direction across the surfaces of the teeth.

Cohen et al. do not show light emitters that lie along a path located in an occlusal direction from the outer tips of the patient's teeth. The Examiner argues that Cohen et al. disclose this aspect "... because the claimed language is not directed to the location of the light emitters but referred to broadly in terms of the oral anatomy (teeth) of the patient and even so not specific as to which tooth or teeth of a full dentition of the patient the direction is to be taken and from which outer tips ..." (Examiner's Answer, page 3, lines 12-15). Applicants respectfully disagree. Claim 43 is directed to a method of bonding orthodontic appliances to a patient's teeth (line 1), wherein orthodontic appliances are provided for at least two teeth (line 3) and wherein the array of light emitters lie along a path that is located in an occlusal direction from the outer tips of the patient's teeth (line 10). There is no indication that the "teeth" in line 10 are anything other than the "teeth" mentioned in lines 1 and 3. The use of the word "the" in line 10 makes this clear.

The method of bonding orthodontic appliances as set out in claim 43 also recites, in lines 11-12, that light from light emitters is directed in a gingival direction across the surfaces of the teeth and toward the photocurable material. In Cohen et al., light emitted in a lingual direction is directed toward the surfaces of the teeth and not across the surfaces of the teeth. Light traveling in a lingual direction as described by Cohen et al. is not equivalent to light traveling in a gingival direction as set out in applicant's claim. The Examiner's Answer indicates that Cohen et al. teach this aspect because the light "... is referred to broadly in terms of the surfaces of the teeth of the patient and not specific as to which surfaces of the tooth or teeth of a full dentition of the patient. ..." (Examiner's Answer, page 3, lines 18-19). Again, Applicant's respectfully disagree

because there is no indication in claim 43 that the word “teeth” in line 12 of claim 43 means anything other than the word “teeth” in lines 1 and 3 of claim 43.

Hare does not describe methods of bonding orthodontic appliances to teeth. Hare describes apparatus for curing of impression materials and other unspecified materials, but does not address the issues associated with getting light to orthodontic adhesive that is sandwiched between the bottom of an orthodontic appliance and a tooth surface. In the methods described by Hare, light is blocked from even reaching the tooth surfaces by the impression material.

There is no apparent reason from the cited references why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed. The problem to be solved is an improved method of bonding orthodontic appliances to teeth. Cohen et al. describe orthodontic bonding methods, but Hare does not. In the embodiments described by Hare, light does not reach the teeth, let alone reach orthodontic adhesive that is between the appliance and the tooth.

In summary, with respect to claim 43, neither reference teaches (1) a method of orthodontic bonding using an array of solid state light emitters within the oral cavity, (2) a method of orthodontic bonding using an array of light emitters that lie along a path that is located in an occlusal direction from the outer tips of the patient’s teeth, or (3) a method of orthodontic bonding wherein light is directed in a gingival direction and across the surfaces of the teeth.

Claim 46 additionally recites that the array of solid state light emitters is located adjacent a channel of the placement device. Claim 47 depends from claim 46 and adds that the array extends along a longitudinal axis of the channel. Both claims 46 and 47 depend from claims 44 and 45, which recite that the substrate comprises an indirect bonding placement device that comprises a shell.

The cited references do not disclose an indirect bonding placement device with solid state light emitters adjacent a channel that corresponds to the shape of at least a portion of the patient’s dental arch, as described in claim 46. Cohen et al. teach the use of light sources for a tray with a channel, but does not teach the use of solid state light sources that lie along a path in an occlusal direction from outer tips of the teeth and are also located adjacent the channel. The subject matter set out in claims 46 and 47 is advantageous in that the solid state light sources can

be located very near the appliances within the tray, but yet still direct light in a gingival direction across the tooth surfaces.

With respect to claim 49, it is respectfully submitted that the reasoning set out in page 4, lines 11-13 of the Examiner's Answer is incorrect. Column 3, line 29 of Cohen et al. describes a mold, positioner or tray that is in conforming engagement with the teeth and gums. Nothing in this passage even remotely suggests holding such a mold, positioner or tray by clamping it between the upper and lower teeth of the patient. It is common for an indirect bonding tray to have a shape that matches the adjacent teeth and gums so that the tray does not wobble and places the brackets on the teeth at precise positions. However, such trays are not clamped between upper and lower teeth of the patient during a bonding procedure. Instead, the trays are placed in contact with a single arch and out of contact with the opposing arch. The tray of Cohen et al., like other indirect bonding trays, has a flexible, resilient character (see Column 2, lines 28-29). If the tray of Cohen et al. were clamped between the upper and lower teeth, the tray would likely distort in shape and place the brackets in unintended positions. Hare is also silent with respect to clamping his apparatus between opposing teeth, probably for the same reason (i.e., any clamping between the dental arches would likely lead to an unsatisfactory result because the shape of the tray and the resulting impression would be distorted).

Summary

For at least the reasons presented in Applicant's Brief on Appeal and in this Reply Brief, Applicant's respectfully request that the Board review and reverse the rejections of claims 43-52 as discussed herein, and that notification of the allowance of these claims be issued.

Respectfully submitted,

May 9, 2007

Date

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